CLAIMS

1. A method for evaluating traffic dispersion at at least one exchange (Ex_k) in a communications network, the exchange (Ex_k) being arranged for applying a set of routing rules (RL_k) in selectively allotting to a plurality of links incoming traffic directed towards a given destination, characterised in that it includes the steps of:

- incrementally (202, 214) generating (208) traffic quantums representative of said traffic, and
- producing a distribution (210) of said traffic quantums over said links in said plurality according to said set of routing rules (RL_k), the distribution thus obtained being statistically representative of the dispersion of said incoming traffic over said plurality of links at said exchange (EX_k).

2. The method of claim 1, characterised in that it includes the steps of:

- measuring (12; TM_k) the volume of said incoming traffic directed towards said given destination, and
- generating (208) said traffic quantums by subdividing said measured traffic volume by a given number of loop steps.

3. The method of claim 1, characterised in that it includes the steps:

- determining, for each link in said plurality, a number of call attempts and a corresponding number of seizures,
- if said number of call attempts equals said number of seizures, setting a load limit for applying said set of routing rules (RL_k) for said link equal to the number of circuits available in the link, and
- if said number of call attempts is greater than said respective number of seizures, setting said load limit equal to the outgoing traffic volume measured (TM_k) by the exchange (Ex_k) on said link.

4. The method of claim 1, characterised in that it includes the steps of:

- accepting said traffic quantums to be assigned to a given link only if the sum of all the traffic portions assigned to said link is smaller than the said load limit set for said link,

- otherwise selecting a next choice in said set of routing rules (RL_k).

5. The method of claim 1, characterised in that it includes the steps of:

- selecting within said network at least a first exchange (EX_k) receiving traffic from at least a second (EX_m) and a third (EX_n) exchange, and

- obtaining, based on respective distributions of said quantums of traffic generated at said second (EX_m) and third (EX_n) exchanges, traffic dispersion data indicative of:

  - the traffic (TV_{mxp}) incoming into said first exchange (EX_k) from said second exchange (EX_m),

  - the traffic (TV_{nxr}) incoming into said first exchange (EX_k) from said third exchange (Ex_n).

6. The method of claim 5, characterised in that it includes the step of obtaining, based on respective distributions of said quantums of traffic, distribution data representative of the traffic towards a given destination (x) generated at said first exchange (EX_k) different from traffic (TV_{mxp}, TV_{nxr}) incoming from said second (EX_m) and third (EX_n) exchanges.

7. The method of claim 5, characterised in that it includes the steps of:

- partitioning the traffic outgoing from said first exchange (EX_k) based on the respective routing rules (RL_k) into:

- a first group (A), including traffic components coming from said second exchange (EX_m) using a given subset of links in said set of routing rules, and

- a second group (B), including traffic components coming from said third exchange (Ex_n) exchange using the whole set of links in said set of routing rules.

8. The method of claim 7, characterised in that it includes the steps of:

- analysing the traffic volume (TV_{kxy}) directed toward a given destination (x) within said network and carried by a respective link (CG_y) coming out of said first exchange (EX_k),

- determining a first component of said traffic volume (TV_{kxy}) coming from said second exchange (EX_m) as

$$TV_{kxy,m} = \frac{TV_{mxp} \times TV_{kxy}}{\sum_{\forall CG \in \Delta} TV_{kx\delta}}$$

wherein Δ is the subset of links used by a current routing rule in said first exchange (EX_k).

9. The method of claim 8, characterised in that it includes the steps of:

- analysing the traffic volume (TV_{kxy}) directed toward a given destination (x) within said network and carried by a respective link (CG_y) coming out of said first exchange (EX_k),

- determining a first component of said traffic volume (TV_{kxy}) coming from said third exchange (EX_n) as

$$TV_{kxy,n} = \frac{TV_{nxr} \times \left(TV_{kxy} - TV_{kxy,A}\right)}{\sum_{\forall CG \in \Phi} \left(TV_{kx\delta} - TV_{kx\delta,A}\right)}$$

wherein $TV_{kxy,A} = \sum_{\alpha}^{\forall \alpha \in A} TV_{kxy,\alpha}$ is the sum of all the results obtained for said second exchange (EX_m) for all the links used by said routing rule and Φ is the whole set of links used by a current routing rule in said first exchange (EX_k).

10. The method of claim 1, characterised in that said steps of incrementally (202, 214) generating (208) traffic quantums representative of said traffic and producing a distribution (210) of said traffic quantums are performed in the absence of interference with operation of said communications network.

11. A system for evaluating traffic dispersion at at least one exchange (Ex_k) in a communications network, the exchange (Ex_k) being arranged for applying a set of routing rules (RL_k) in selectively allotting to a plurality of links incoming traffic directed towards a given destination, characterised in that it includes a evaluation module (16) configured for:

- incrementally (202, 214) generating (208) traffic quantums representative of said traffic, and

- producing a distribution (210) of said traffic quantums over said links in said plurality according to said set of routing rules (RL_k), the distribution thus obtained being statistically representative of the dispersion of said incoming traffic over said plurality of links at said exchange (EX_k).

12. The system of claim 11, characterised in that it includes a measuring module (12) for measuring (TM_k) the volume of said incoming traffic directed towards said given destination, and in that said evaluation module (16) is configured for generating (208) said traffic quantums by subdividing the traffic volume measured by said measuring module (12) by a given number of loop steps.

13. The system of claim 11, characterised in that it includes:

- a measuring module (12) configured for determining, for each link in said plurality, a number of call attempts and a corresponding number of seizures,

- a routing rules generating module (14) for setting a load limit for applying said set of routing

rules (RL_k), said routing rules generating module (14) being configured for:

- if said number of call attempts equals said number of seizures, setting a load limit for applying said set of routing rules (RL_k) for said link equal to the number of circuits available in the link, and

- if said number of call attempts is greater than said respective number of seizures, setting said load limit equal to the outgoing traffic volume measured (TM_k) by said measuring module (12) on said link.

14. The system of claim 11, characterised in that it includes a routing rules generating module (14) configured for:

- accepting said traffic quantums to be assigned to a given link only if the sum of all the traffic portions assigned to said link is smaller than the said load limit set for said link,

- otherwise selecting a next choice in said set of routing rules (RL_k).

15. The system of claim 11, for use in a network (N) including at least a first exchange (Ex_k) receiving traffic from at least a second (EX_m) and a third (Ex_n) exchange, characterised in that it includes at least one said evaluation module (16) configured for:

- obtaining, based on respective distributions of said quantums of traffic generated at said second (EX_m) and third (Ex_n) exchanges, traffic dispersion data indicative of:

- the traffic (TV_{mxp}) incoming into said first exchange (EX_k) from said second exchange (EX_m),

- the traffic (TV_{nxr}) incoming into said first exchange (EX_k) from said third exchange (Ex_n).

16. The system of claim 15, characterised in that said at least one evaluation module (16) is configured for obtaining, based on respective distributions of

said quantums of traffic, distribution data representative of the traffic towards a given destination (x) generated at said first exchange (EX_k) different from traffic (TV_{mxp}, TV_{nxr}) incoming from said second (EX_m) and third (Ex_n) exchanges.

17. The system of claim 15, characterised in that said evaluation module (16) is configured for:

- partitioning the traffic outgoing from said first exchange (EX_k) based on the respective routing rules (RL_k) into:

- a first group (A), including traffic components coming from said second exchange (Ex_m) using a given subset of links in said set of routing rules, and

- a second group (B), including traffic components coming form said third exchange (Ex_n) using the whole set of links in said set of routing rules.

18. The system of claim 17, characterised in that said at least one valuation module (16) is configured for:

- analysing the traffic volume (TV_{kxy}) directed toward a given destination (x) within said network and carried by a respective link (CG_y) coming out of said first exchange (EX_k),

- determining a first component of said traffic volume (Tv_{kxy}) coming from said second exchange (EX_m) as

$$TV_{kxy,m} = \frac{TV_{mxp} \times TV_{kxy}}{\sum_{\forall CG \in \Delta} TV_{kx\delta}}$$

wherein Δ is the subset of links used by a current routing rule in said first exchange (EX_k).

19. The system of claim 18, characterised in that said evaluation module (16) is configured for:

- analysing the traffic volume (TV_{kxy}) directed toward a given destination (x) within said network and

carried by a respective link (CG_y) coming out of said first exchange (EX_k),

- determining a first component of said traffic volume (TV_{kxy}) coming from said third exchange (EX_n) as

$$TV_{kxy,n} = \frac{TV_{nxr} \times \left(TV_{kxy} - TV_{kxy,A}\right)}{\sum_{\delta}^{\forall CG \in \Phi} \left(TV_{kx\delta} - TV_{kx\delta,A}\right)}$$

wherein $TV_{kxy,A} = \sum_{\alpha}^{\forall \alpha \in A} TV_{kxy,\alpha}$ is the sum of all the results obtained for said second exchange (EX_m) for all the links used by said routing rule and Φ is the whole set of links used by a current routing rule in said first exchange (EX_k).

20. The system of claim 11, characterised in that said evaluation module (16) is configured for performing said steps of incrementally (202, 214) generating (208) traffic quantums representative of said traffic and producing a distribution (210) of said traffic quantums in the absence of interference with operation of said communications network.

21. A communication network including a plurality of exchanges (1, 2,.....n), characterised in that it includes a system according to any of claims 11 to 20.

22. A computer program product loadable in the memory of at least one computer (10 - 16) and including software code portions for performing the method of any of claims 1 to 10 when the product is run on a computer.